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were, in the carbon and oxygen thus separated. Rather this energy was transformed to chemism, an active kinetic energy, a vibration of oxygen atoms in the oxygen molecule, and a vibration of carbon atoms in the carbon molecule, or, more correctly, a vibration of the atoms of the complex molecules forming the vegetable structure. The sum of the amount of vibration in the oxygen molecules, as such, and the amount of vibration in the vegetable molecules, is more than was the amount of atomic vibration in the carbon dioxide before it was separated, by just that degree of energy represented by the solar heat and light employed in the separation. But, to induce this higher rate of vibration necessary to the existence of the new molecules of oxygen and carbon, is not storing energy in those molecules any more than it is "storing energy" to convert the energy of motion of a revolving armature to electricity. In short, the energy of the sun's heat and light is converted to chemism, a form of kinetic energy. When now, ages after those plants have grown and fallen to earth and become coal, the conditions being made favorable for the carbon to unite with oxygen, they combine; chemism is again transformed to heat and light.

Would it not be well for authors of text-books on physics to drop this very meaningless and annoying expression of "potential" energy? Let the student be taught that all energy is kinetic. Let him know that if energy disappears in one form of motion it surely appears in some other form of motion, and that to speak of a body at rest as having any kind of energy whatever is an absurdity.

SOME STATISTICS RELATING TO THE HEALTH OF COLLEGE WOMEN.

BY GERTRUDE CROTTY, LAWRENCE.

"Paris," writes Colonel Higginson, "smiled for an hour or two, in the year 1801, when, amidst Napoleon's mighty projects for remodeling the religion and government of his empire, the ironical satirist, Sylvian Marechal, thrust in his 'Plan for Prohibiting the Alphabet to Women.'" I hope you, in the year 1891, will find occasion to smile at the thought that woman should not attend college, because, as is claimed, of her mental inferiority to men, or her physical inability to endure college training. If her mind is weak, then it ought by all means to be strengthened, provided always that it is not done at the expense of her physical welfare. But it is not my purpose to consider woman's mental strength, as compared with that of man, or to treat of her mind in any respect, except in so far as study affects her mind, and her mental condition affects her health.

Doctor Beard, an eminent physician and psychologist of New York, in investigating the effect of scholarly employment upon the length of men's lives, computed the lives of 500 men of mental attainments—poets, philosophers, scientists, educators, lawyers, physicians, etc.—and found the average age to be 64 years; while the average life of the masses was but 50 years, and even then only those who lived to be 20 years of age or over were included in his calculation. The average age of 100 brain workers of our own time he found to be 70 years. If mental occupation is instrumental in lengthening men's lives, why may not women likewise profit by it?

We hear a great deal of complaint to the effect that the American woman is physically inferior to the women of Europe—of Germany. And only too often are we told that this physical weakness is the result of confinement in schoolrooms, and of

overtaxing of brains and nerves. But do these criticisms concerning physical infirmities hold good for the American woman alone? Innumerable statements have been made by foreigners who visit America to the effect that the American—the man as well as the woman—lives too rapidly—works too hard, lives upon his nerves, eats too much, sleeps too little, takes too few holidays and too little healthful, mental recreation. May not, in all justice, a share of the American woman's frailty be ascribed to the above causes, rather than to her excessive schooling? Moreover, custom demands less outdoor sport for girls than for boys. The American woman walks less than her English sister. The American must traverse so much greater distances in order to get anywhere, that only artificial transportation is feasible. Again, the climate in many parts of America is not as conducive to comfortable walking as is that of England. The American girl does not walk in the fields with her governess, but is sent to public schools. Here she might have the benefit of healthful games upon the playground, but propriety forbids to her baseball, black-man, tree climbing, and various harmless sports. On the other hand, she is told from earliest childhood that she must "try to be a little lady." The significance of this remark is that she must engage in no sports with her brothers, or she will become a "tomboy." As a result, she becomes a listless, conscious, artificial child.

But our present styles of clothing are doubtless no less injurious to physical development than lack of exercise, air, and cheerfulness. I quote from another, that "all this martyrdom to propriety and fashion tells upon strength and symmetry, and the girl reaches womanhood a wreck; that she reaches it at all, under these sufferings and bleached-out conditions, is due to the superior elasticity to resist a method of education which would have killed off the boys years ago." This statement may be rather strongly put, yet you will readily recognize the approximate justice of it.

It is very difficult for us to grow out of our prejudices; but there are very few people to-day who will agree with Lessing, the great philanthropist, that "the woman who thinks is like the man who puts on rouge—ridiculous;" and we smile at the quaint saying of Simon of Athens, "If there sit 12 women at the table, let a dozen of them be—as they are." In so far as we may retain all our womanliness, I trust we shall remain as we are. But culture is in no wise incompatible with womanliness. I hope the two words will become synonymous.

Those who claim that woman is physically too weak to endure the strain of a college course base their arguments upon the statements that she possesses a peculiarly nervous organization and a small brain; that her fewer ounces of brain will forever debar her from reaching what man has attained; that her brain is not an inventive one, and that she will waste her time and strength in striving after the unattainable. Whether women may accomplish what man has accomplished, whether she can or ever will be enabled by cultivation to invent, are questions we will not discuss; but whether she can endure the physical strain of acquiring an education, we may, in the light of statistics, consider.

There have been, of course, numerous adverse articles written by scholarly men, and even by women; but allow me to quote from a letter written by Professor Huxley to the *Times*. He says: "We hear a great deal lately about the physical disabilities of women. Some of these alleged impediments no doubt are really inherent in their organization, but nine-tenths of them are artificial—the product of their mode of life. I believe that nothing would tend so effectually to get rid of these creations of idleness, weariness, and that over-stimulation of emotion, than a fair share of healthy work, directed toward a definite object, combined with an equally fair share of healthy play during the years of adolescence; and those who are best acquainted

with the acquirements of an average medical practitioner will find it hardest to believe that the attempt to reach that standard is likely to prove exhausting to an ordinarily intelligent and well-educated young woman."

The reviewer for the *Popular Science Monthly* writes of a lecture on "The Establishment and Maintenance of Brain Health," delivered at Edinburgh, by Dr. J. Batly Tuke: "Among women, idleness and ignorance are much more prolific causes of disease than overwork. It is not work, but worry, that kills the brain. The most highly-educated and hard-working women the lecturer knew were eminently healthy." One other quotation seems so applicable to the subject in question that I cannot refrain from adding it: "Brain work is the highest of all antidotes to worry; and the brain-working classes are, therefore, less distressed about many things, less apprehensive of indefinite evil, and less disposed to magnify minute trials, than those who live by the labor of the hands. To the happy brain worker, life is a long vacation; while the muscle worker often finds no joy in his daily toils, and very little in the intervals. Scientists, physicians, lawyers, clergymen, orators, statesmen, literati, and merchants, when successful, are happy in their work, without reference to the reward, and continue to work in their special calling long after the necessity has ceased."

Those who have given the subject attention are willing to grant that mental occupation, freedom from morbid self-contemplation, is conducive to good health. We are cured of our imaginary illnesses when we have forgotten them in our absorption in some foreign theme. Women, it is said, are more imaginative than men; spend more time in daydreaming. In their poverty of experience in the world of thought, the imagination is naturally directed toward the ego.

Statistics relating to the health of college women are beginning to multiply, and they furnish abundant proof that "study is the discipline and tonic that most girls need to supplant the too great sentimentality and useless daydreams, fostered by fashionable idleness and provocation of nerves, melancholy, and inanition," and prove, so far as statistics can, that "the woman graduates of those colleges make as healthy and happy wives and mothers as though they had never solved a mathematical problem or translated Aristotle."

What a fruitful and healthful field for the imagination a woman will find in classics, history, the Arthurian romances, Shakespeare, or the Chanson de Roland! The mind refreshed for the first time by these must feel as though it were liberated from a dungeon. The awakening of a woman's mind to the beauties of literature, thought, nature, will always, I suppose, be one of the favorite themes of the novelist. Let me recall to your minds a few sentences from Charlotte Brontë's description of one of her characters, Frances, in "The Professor." "Frances did not become pale or feeble in consequence of her sedentary employment. Perhaps the stimulus it communicated to her mind counterbalanced the inaction it imposed on her body. She changed, indeed, changed obviously and rapidly; but it was for the better. When I first saw her, her countenance was sunless, her complexion colorless. She looked like one who had no source of enjoyment, no store of bliss anywhere in the world. Now, this cloud had passed from her mien, leaving space for the dawn of hope and interest, and those feelings rose like a clear morning, animating what had been depressed, tinting what had been pale," and thus the description continues. Possibly Frances was stimulated to study not by her love of learning alone. Every one has the fortune to have met at least a few cultured women. The graceful expression of thought and countenance, the tone of the voice of a cultured woman, are indescribably fascinating.

But we must hasten to our statistics. Swathmore, a Quaker college, claims

"steady" improvement in the health of its girl graduates. The Association of Collegiate Alumnae has collected statistics relating to the health of college women. These statistics have been incorporated in the report of the Massachusetts labor bureau. According to this report, returns have been received from 12 institutions that have graduated 1,290 women. Of these 1,290 graduates, 54.65 per cent., or 705, have reported; 19.5 per cent. of the 705 report deterioration in health during attendance at college; 59.3 per cent. report no change, and 21.1 per cent. an improvement.

A great deal is said, even in Kansas, about girls not being strong enough to attend college, and, by those who are, perhaps, not friends of the State University, about the injury to the physical welfare of girls caused by climbing the hill upon which the University is situated. These same people who complain enjoy a summer of mountain climbing in Colorado unattended by any physical injury. Six years of observation at the University tell me that very few of the girls themselves make or have occasion to make any such complaint. Occasionally a girl, humiliated at her mental inability to meet the requirements of the University, severs her connection with the University "on account of her health." The young men, under similar circumstances, are obliged to "go into business."

In all justice, let it be said, occasionally a girl breaks down from overwork. Women who have never attended college sometimes overexert themselves. But I am inclined to believe that, in almost every instance, if a girl breaks down attending college, this failure in health can be traced far more readily to social indulgence or to some other neglect of the primary rules of health than to her mental occupation. In order to test the accuracy of my impression, a list of 18 questions concerning the manner of living and studying while in college was sent to the women who have been graduated from the State University. Some one might object, however, that only the stronger women completed a college course. In order to meet this objection, a similar list of questions was sent to all the women who were undergraduates last year. In the collegiate department of the school year 1890-'91, there were 57 women in attendance, excluding those who were members of the senior class. Nineteen of the 57 did not return this fall. Upon comparing this falling off in proportion to the attendance with that of other years, it was found to be the average. Of the 19 who have not returned this fall, 8 are teaching, traveling, or attending other schools; 2 are detained on account of ill health; 3 dropped out the first month of last school year; and 6 were not entered by the University, being excluded by our double-failure rule. Therefore, 35 have returned to the University this fall.

To the questions sent out to the women of last year, 35 replies have been received, 33 of which came from women in attendance this year. Five who have returned have not replied. Nineteen of the 35 who replied report that their health is the same in college as before entrance. Three report worse health while at the University. One of the three attributes this difference to financial and domestic troubles rather than to study. Two entered who had consumption, and both lost strength. One of the two, however, was sent home last year on account of the double-failure rule. Two others, who did not reply, are to my knowledge, ill; consequently, four in all, and possibly five, are detained on account of physical inability. Twelve report health since coming to college as decidedly better. This improvement they attribute to more regular habits of life; they eat at certain hours, eat less between meals, arise and retire at the same hours. College, they say, forces them to systematize their work. Others attribute this improvement to their calmer mental condition; they derive satisfaction—peace of mind—from the knowledge that they are accomplishing something, or, in their enthusiasm and appreciation for their studies, they "forget about themselves." Two out of the 35 thought the walk

up the hill injurious, and two complained, not about the hill, but the stairs at the University. Only three or four take systematic exercise. Thirteen assist in making their own wardrobe, and 30 take care of their own rooms.

The same list of questions was sent to the graduates. The State University of Kansas has graduated 101 women in all from the regular collegiate courses. Three of the graduates have died, while the addresses of three others could not be obtained; therefore, 95 communications were sent; 55 replies have been received; 32 of the 55 report health in college the same as before entering; 8 report health worse while in the University—2 of the 8, however, for a portion of one year only; 11 report health while at the University much better than before entrance. All those who reported (and many did so report) "If there was any change, it was for the better," were included in the list "health the same." Forty-one report health since leaving school "good," or "the same;" 6 report health "better since graduation," and 6 "health not so good;" 35 consider that University life has no effect upon health at all; 4 believe that health is injured by University work, and 9 state that their health was much improved by their college experience; 3 report "climbing the hill" injurious, and 44 not injurious; on the other hand, many consider the hill "a blessing." The alumnae spent, on an average, 9½ hours per day in study and recitation. Twenty-one of these 51 who have reported are married.

I wish I could tell you all the valuable suggestions sent to me in reply to the question, "What suggestions would you make in regard to improving the physical health of Kansas State University women?" Space, however, will forbid the inclusion of but one or two of these replies. Many of the graduates suggest that the girls should avoid too much social recreation of one character—dancing; but urge that more frequent formal receptions and social gatherings, at which the girls could meet and talk with cultured people, would be a lasting pleasure and benefit to them. All are unanimous in the wish for a gymnasium, in which the girls could receive systematic physical training.

NOTES ON SOME NEW SPECIES OF FOSSIL CEPHALOPODS.

BY ROBERT HAY, F. G. S. A.

Five years ago the writer obtained, from strata that he has been calling permocarboniferous, near Junction City, a fragment of a large nautiloid cephalopod. Having the impression that the fossils of the region had been exhaustively examined, he kept it without special note, not seeking then to have its species identified. Three years ago a fine cephalopod of a distinct type was given to me by Capt. Geo. E. Pond, quartermaster of Fort Riley, who had obtained it from the quarries worked on the military reservation. I obtained others about the same time from nearly the same horizon, further to the southwest. Captain Pond was also making a collection to go to the museum at West Point, and I undertook to have them named for him. The result was, I sent his collection and my own to Prof. Alphæus Hyatt, of Boston, our best authority on cephalopods. This was early in 1890. About the same time Professor Hyatt received a collection from the geological survey of Texas, from about the same horizon, and he also examined a number of specimens in the National Museum, at Washington, that had been sent from Kansas by Doctor Newlon, of Oswego.

Among the Texas specimens were some of the same species as those from Geary